Draft Biological Evaluation

North Shore Restoration Project

Upper Lake Ranger District

Mendocino National Forest

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Signatures: _____

Date: _____

Contents

Introduction

Purpose

The purpose of this Biological Evaluation (BE) is to analyze the proposed activities associated with the North Shore Restoration Project to determine effects on Threatened, Endangered, or Proposed species on the Federal Endangered Species List and Forest Service Sensitive Species. Management Indicator Species and migratory birds are discussed in separate reports.

Regulatory Framework

This BE was prepared in accordance with Forest Service Manual (FSM) direction 2620, 2630, 2670, 2672, 2672.42 and meets legal requirements set forth under Section 7 of the Endangered Species Act of 1973, as amended [19 U.S.C. 1536 (c, 50 CFR 402.12 (f) and 402.14 (c); the Bald and Golden Eagle Protection Act of 1940, as amended; Migratory Bird Treaty Act of 1918 (as amended); Executive Order 13186 (migratory birds); National Environmental Policy Act, 1969; National Forest Management Act, 1976 (as amended); Northwest Forest Plan; and Mendocino National Forest Land and Resource Management Plan, 1995, as amended.

Location

The North Shore Restoration Project (North Shore) is located on the Upper Lake Ranger District on the Mendocino National Forest within the perimeter of the 2018 Ranch Fire on National Forest System lands (see Figure 1, North Shore EA). The project is located within the Wildland Urban Interface for communities along the north and east of Clear Lake.

TABLE 1: SPECIES CONSIDERED

Species	Designation	Habitat/Range	Habitat w/in analysis area	Carried forward in analysis
Northern spotted owl (*Strix occidentalis caurina*)	ESA Threatened	Mature forests with dense canopies	Yes	Yes
Western snowy plover (*Charadrius nivosus nivosus*)	Threatened	Shorelines	No	No
Fisher (*Pekania pennanti*)	FS Sensitive	Complex vertical and horizontal structure characteristics of late-seral forests	Yes	Yes
California red-legged frog (*Rana draytonii*)	ESA Threatened	Pools and backwaters within streams and creeks, ponds, marshes, springs, sag ponds, dune ponds, and lagoons	No	No[1]
Southern Oregon Northern California Coast Coho salmon ESU (*Oncorhynchus kisutch)*	ESA Threatened	Main stem and Middle fork of the Eel river and it's tributaries	No	No

Southern Oregon Northern California Coast Coho salmon ESU Critical Habitat	ESA Threatened	Main stem and Middle fork of the Eel River below Scott Dam	No	No
California Coastal Chinook salmon ESU (*Oncorhynchus tshawytscha)*	ESA Threatened	Main stem and Middle fork of the Eel river and it's tributaries	No	No
California Coastal Chinook salmon ESU Critical Habitat	ESA Threatened	Main stem and Middle fork of the Eel River below Scott Dam	No	No
Chinook salmon – Central Valley Spring Run ESU	ESA Threatened		No	No
Chinook salmon – Sacramento River Winter Run ESU	ESA Threatened		No	No
Chinook salmon – Sacramento River DPS – Critical Habitat	ESA Threatened		No	No
Northern California Steelhead trout (Oncorhynchus mykiss)	ESA Threatened		No	No
Northern California Steelhead trout Critical Habitat	ESA Threatened		No	No
Steelhead – California Central Valley DPS	ESA Threatened		No	No
Steelhead – California Central Valley DPS Critical Habitat	ESA Threatened		No	No
Delta smelt (*Hypomesus transpacificus)*	ESA Threatened		No	No
Green Sturgeon – Southern DPS (*Acipenser medirostris)*	ESA Threatened		No	No
Vernal pool fairy shrimp (*Branchinecta lynchi*)	ESA Threatened		No	No

Vernal pool tadpole shrimp (*Lepidurus packardi*)	ESA Endangered		No	No
Northern goshawk (*Accipiter gentilis*)	FS Sensitive	Mature to old growth forest with large trees and high canopy closure	Yes	Yes
Willow flycatcher[2] (*Empidonax traillii*)	FS Sensitive	Standing or running water with willows or other shrubs	Yes	No
Bald eagle (*Haliaeetus leucocephalus*)	FS Sensitive	Forested areas adjacent to large bodies of water	Yes	Yes
Fringed myotis (*Mytosi thysanodes*)	FS Sensitive	Caves, mine tunnels, rock crevices, and old buildings	Yes	Yes
Pallid bat (*Antrozous pallidus*)	FS Sensitive	Rocky outcrops in desert scrub	Yes	Yes
Townsend's big-eared bat (*Corynorhinus townsendii*)	FS Sensitive	Montane forests with caves, cliffs, and rock ledges, and may use abandoned mines and other manmade structures	Yes	Yes
North American wolverine (*Gulo gulo luscus*)	FS Sensitive	Boreal forests, tundra, and western mountains with arctic tundra, subarctic-alpine tundra, boreal forest, northeast mixed forest, redwood forest, and coniferous forest	No	No
Pacific marten (*Martes caurina*)	FS Sensitive	Montane forests with mature and old conifer forests	Yes	Yes
Foothill yellow-legged frog (*Rana boylii*)	FS Sensitive	Streams in valley-foothill hardwood, valley-foothill hardwood-conifer, valley-foothill riparian, ponderosa pine, mixed conifer, mixed chaparral, and wet meadows with 20-90% shading	Yes	Yes
Western pond turtle (*Actinemys marmorata*)	FS Sensitive	Permanent and ephemeral aquatic habitats such as rivers, ponds, streams, lakes,	Yes	Yes

		wetland habitats, and altered habitats		
Karin's checkerspot butterfly (*Euphydryas editha karinae*)	FS Sensitive	Monkey Rock & Hull Mountain	No	No
Pacific Lamprey (*Entosphenus tridentatus)*	FS Sensitive	Eel river and it's tributaries; Upper and Lower Cache Creek drainages	Yes	Yes
Western Brook Lamprey (*Lampetra richardsoni*)	FS Sensitive	Eel River and it's tributaries; Upper and Lower Cache Creek drainages	Yes	Yes
Clear Lake Hitch (*Lavinia exilicaudachi*)	FS Sensitive	Clear Lake and it's tributaries	Yes	Yes
Hardhead (*Mylopharodon conocephalus)*	FS Sensitive	Upper and Lower Cache Creek drainages	Yes	Yes

Methodology

Northern Spotted Owl

Yreka Fish & Wildlife Service office developed a post-fire habitat layer to analyze effects from projects on remaining Northern Spotted Owl habitat. To do this they acquired existing vegetation (EVEG) layers from the forest (they did this process for the Klamath and Six Rivers, too), being aware that the EVEG layer is not 100% accurate for these forests. The EVEG layers were overlaid with RAVG data for fires from 2008 until present. For the Mendocino National Forest that included Mill (2008), North Pass (2012), and Ranch (2018) Fires. The RAVG (Rapid Assessment of Vegetation Condition) program assesses post-fire vegetation condition for large wildfires on forested National Forest System (NFS) lands. For FWS's process the RAVG data was divided into gridcodes 1, 2, 3 & 4. Gridcode 1 described basal area lost at 0-25%, gridecode 2 is BA lost at 25-50%, gridecode 3 is 50-75%, and gridecode 4 is basal area lost at greater than 75 percent. The following table describes how gridcodes change habitat types for northern spotted owl (Table 2).

TABLE 2: POST FIRE HABITAT BASED ON BASAL AREA LOST

	Basal Area Lost			
	0-25%	25-50%	50-75%	75-100%
Pre-Fire Habitat	**Post-Fire Habitat**			
Nest/Roost	Nest/Roost	Foraging	Post-fire foraging	Post-fire foraging
Foraging	Foraging	Foraging	Post-fire foraging	Post-fire foraging
Dispersal	Dispersal	Dispersal	X	X

Using this post-fire habitat layer and field verification areas of concern and potential treatments areas a new habitat layer was developed for project analysis. This layer reflects the habitat on the ground to the best of our knowledge.

Consultation History

On June 25, 2019, John Hunter and Katie Siedel from the Arcata Fish & Wildlife Service Office visited the North Shore restoration project area with Forest Service employees representing a variety of resources; Cassie Hagemann (wildlife biologist), Gabrielle Bohlman (ecologist), Gary Urdahl (silviculturalist), Hinda Darner and Amy Galetka (fuels specialists), Frank Aebly (district ranger), and Josh Abel (fish biologist). We were able to visit two of the three 100 acre Late Successional Reserves (LSR) in the project area, 4040 and 4041.

Prior to the Ranch Fire in 2018 there was another stand replacing wildfire in 1996, the Fork Fire. The Fork Fire removed suitable habitat for spotted owls and the Ranch Fire has compounded these effects by removing more remaining habitat.

We were able to view LSR 4040 and Protected Activity Centers (PAC) from the 15N07 road and the Bartlett Springs Road 303, and just east of 4040 we visited LSR 4041. Both LSRs are almost entirely burned with very few surviving green trees. Since there is no longer any viable nesting/roosting habitat for the PACs it was determined by USFWS and the FS that the PACs 4040 and 4041 are abandoned. AC0025 is just south of LSR4041 and is likely associated with the LSR, it is also abandoned due to the lack of nesting/roosting habitat available.

On July 8, 2019, Cassie Hagemann, Amy Galetka, and Josh Abel visited LSR 4038 and PAC LAK0021. The area is very steep and accessing from above was unsafe and it was difficult to view from the road. We were able to look up at the LSR and PAC from the Bartlett Spring Road and determine that there were a few surviving green trees but a majority of the LSR was burned as well as the surrounding areas. The PAC is located to the east and did not have any surviving green trees nearby. It is also likely that this PAC is abandoned due to the lack of nesting/roosting habitat.

On July 29, 2019, Cassie Hagemann called John Hunter at FWS to discuss updates for the North Shore project. The acreage of Salvage Units (approximately 592) and the unit boundaries at the time of this conversation had not been finalized. The 40,000 acre project area is being described as a large fuels unit. It was discussed that a May Affect, Not Likely determination would be an acceptable call considering the landscape scale work being proposed (see BA for more detailed notes regarding consultation).

Alternatives

Alternative 1 – No Action

This alternative represents the existing and projected future condition against which the other alternatives are compared. Under the no action alternative, no salvage (commercial harvest), fuel reduction, or herbicide treatments would be implemented to accomplish project goals.

Alternative 2 - Proposed Action

To meet the Purpose and Need, the Forest Service proposes a variety of actions concerned with post-fire resource management. The following treatments are proposed:

- Within the Salvage Units, felling and removal of commercial and non-commercial fire-killed or *fire-injured trees following, the Marking Guidelines for Fire-Injured Trees in California (Smith and Cluck 2011). Felling and removal of the fire-killed and or injured trees within the salvage units would take one season, (potentially a six to eight month time period).

*Fire-injured trees include trees that have some green in the crown but are anticipated to die soon following the Ranch Fire.

- Fuel reduction treatments may be applied as both mechanical and hand treatment including pre-commercial and commercial thinning, mastication, cut-and-pile, and use of prescribed fire including understory, chaparral, and pile burning. Only fire-killed trees (no green canopy left) may be removed within fuel treatments. Treatment may be applied as an initial treatment or following other treatments. In many cases multiple entries will be needed. The fuels treatments cover the entire project area and will be ongoing for approximately 30 years with frequent review to ensure analysis is accurate and up to date. MNF will contact USFWS prior to any deviations from this BA. After 30 years, MNF will request TA from USFWS to ensure this project still under compliance with ESA. Reestablish and/or create new fuel breaks to provide strategic areas for future prescribed burning activities and suppression efforts.

- Reforestation will be used to restore vegetation, especially in areas lacking sufficient seed sources, reforestation shall take place on approximately 1,617 acres of conifer forestland where plantations were established in the past. In addition to the area covered by previous plantations, reforestation activities will be applied to areas covered by the Bartlett Roadside Hazard Tree Removal (a component of the Ranch Fire Roadside Hazard Tree Removal Project) CE. 485 acres all the Bartlett Roadside Hazard Tree removal project, falls within the North Shore Project Area and the Salvage Units (592 acres) within the North Shore Project Area. These areas have been identified as a priority to reforest in order to develop future conifer or conifer hardwood forests. Treatments will include planting appropriate conifer and hardwood species within identified treatment units. Specific planting regimes will take into consideration topographic conditions as well as future environmental conditions. For example, lower slopes near stream channels, especially those with north and east aspects, may be capable of sustaining denser habitat in future stands, whereas drier slopes with south and west aspects will likely support fewer trees per acre or more hardwood species. Site preparation activities will take place where appropriate to provide suitable planting conditions. Reforestation will be accomplished by low density tree planting with variable arrangement and species mix. For release of hand planted tree seedlings, manual or mechanical (i.e. mastication) treatments may be used to reduce competition of shrubs, or grasses to the planted trees. Herbicide may also be needed to allow the tree seedlings to become established before the shrub component will overtop and out compete the seedlings. If herbicide is determined the most appropriate means to reduce competition to tree seedlings, triclopyr would be used. Aerial methods will not be used for herbicide treatment.

- Invasive plant treatment is proposed to protect and restore native plant communities, both forested and other types, an invasive plant management plan will be developed. As part of this plan, infestations of invasive plants will be treated with manual, mechanical, cultural, and/or herbicide treatments. Aerial methods will not be used for herbicide treatments. The invasive plant treatment sites comprise a total of 433 acres within the North Shore Restoration Project. The proposed herbicides are aminopyralid, triclopyr, imazapyr, and fluazifop. These chemicals

would all be applied at or below the label rates and mixed with a non-ionic methylated seed oil surfactant and a marker dye. All chemicals would be applied with a backpack sprayer.

- To restore and protect wildlife habitat and connectivity, treatments will incorporate protection of existing habitat structure. Design features to develop future habitat structure will endeavor to meet landscape-wide connectivity needs. The actions include developing a live-tree retention standard, a snag retention standard, a woody debris standard, and incorporating wildlife habitat needs into the reforestation planting plan to enhance connectivity within and among units wherever possible.

- A research project is being developed by the Pacific Northwest Research Station (PNW) Pacific Wildland Fire Sciences Laboratory within the project area. This project will establish a replicated-longitudinal study investigating the effects of post-wildfire salvage and will include a series of permanent research plots. This monitoring program will study the effects of large, high-severity fires and restoration treatments on future wildlife, conifer seed dispersal, tree recruitment, slope stability, soil erosion, aquatic resources, and dead and live fuel succession. It will also track long-term forest resilience and the conservation of native plant and animal species associated with the project area habitats.

Treatments

Treatments will include site preparation for planting and reforestation. This includes reducing hazardous fuels, improving access for planters to sites and reducing competition to the newly planted or naturally regenerated seedlings (figures 2 and 3). One objective of site preparation is to leave enough material on the sites to provide microsites favorable for seedling survival including down woody debris, standing snags, high stumps, and other features which create shade or help to reduce surface temperatures and increase the water holding capacity of the site. Soil compaction can impede growth and reduce survival of seedlings so minimizing site impacts from harvest and subsequent fuels reduction and site preparation will improve reforestation of the site.

Reforestation shall be accomplished by low density planting with variable arrangement and species mix. To achieve desired future conditions, planting density will be at a level that provides for some mortality initially and over time. Trees will be planted using one of three methods: Individual tree planting 14 feet x 14 feet spacing, clustered tree planting, or a combination of the two methods. The silviculturist and the wildlife biologist will evaluate areas where a combination of the two planting designs may be appropriate. Riparian reserves are other areas where a combination may be suitable. Refer to figures 1 and 2.

Cluster planting will have three trees planted approximately 10 feet apart (distance selected randomly within this 10 ft radius) and the clumps will be an average of 25 feet apart depending on site conditions including the amount of ground which can be planted, any existing natural regeneration, and residual trees. If natural regeneration, defined as any later seral conifer species (Douglas-fir, ponderosa pine, sugar pine, incense cedar, white fir, or red fir) or black oak stump sprout or seedling is on the site they will be incorporated into these clusters. This includes any planted or naturally regenerating seedlings and will vary based on areas which can be planted. If seedling densities of both natural and planted

seedlings do not meet desired stocking level sites should then be replanted and any adjustments made to correct problems which may have led to the failure of the first planting.

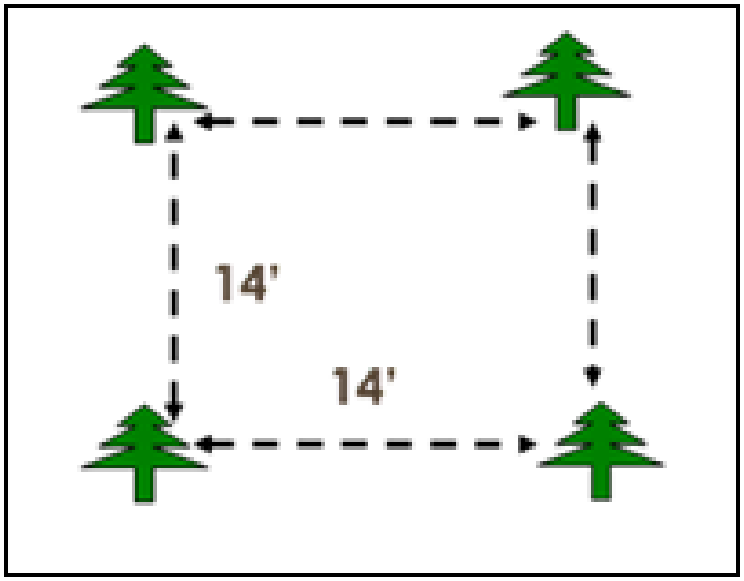

Figure 1 Individual Tree Spacing

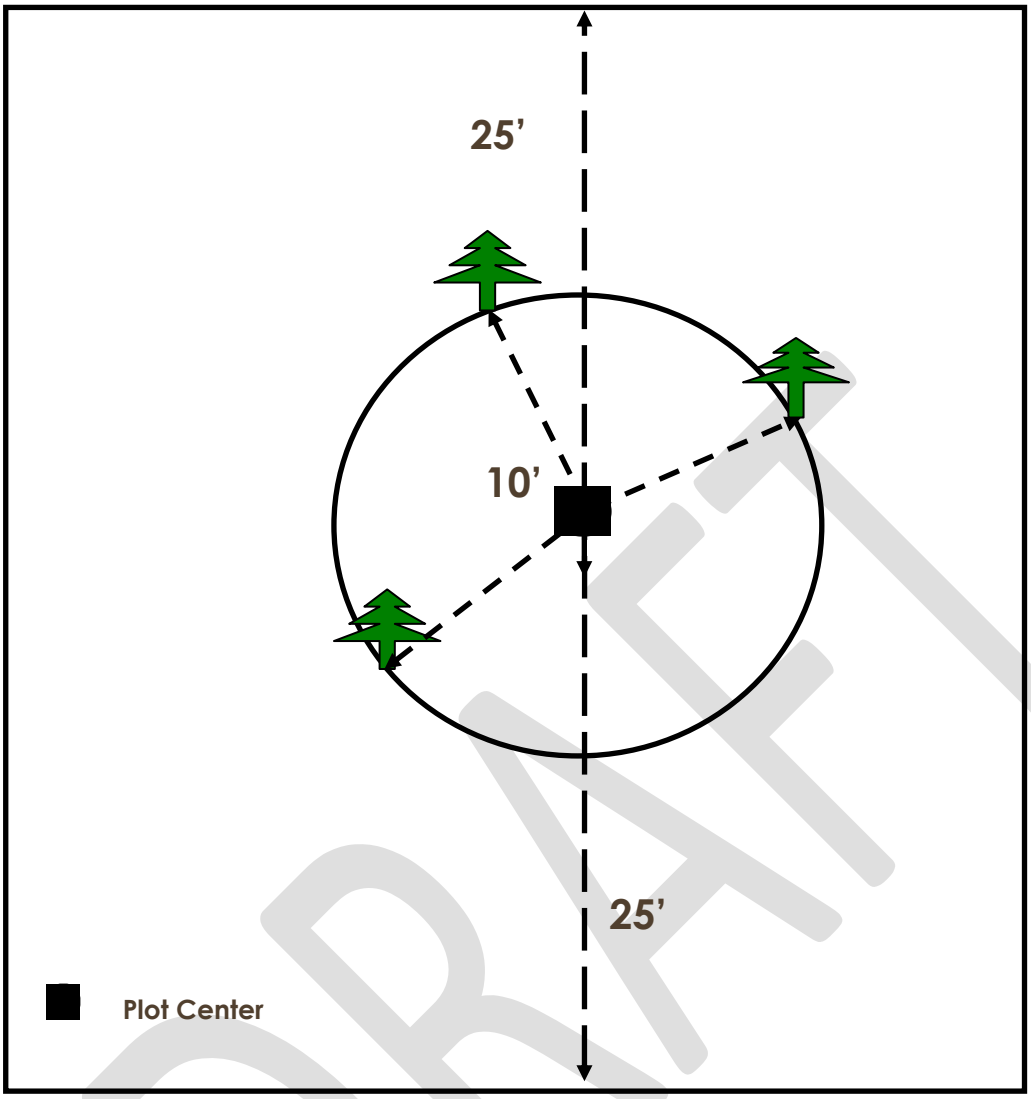

Figure 2 Cluster Planting Diagram

Thinning will space trees out and reduce fuel hazards within the stands. This will also increase individual tree growth and vigor, facilitating the stands to more quickly develop old growth characteristics (Franklin et al. 2007). Target leave trees should generally be the healthiest trees favoring those species best suited to the site. Healthy sugar pine, Douglas-fir, ponderosa pine and incense-cedar will be the most desirable conifers as well as a target of 20 to 30 black oak stems per acre, where available, will also create a more diverse and heterogynous stand. A diversity of species, sizes, and spacing should be maintained where possible to move stands more quickly to old growth characteristics.

Project Design Features and Mitigation Measures

Limited Operating Periods

Since there is no NSO nesting/roosting habitat within the project area and none within 0.25 miles of the project area and historic activity centers have been abandoned, there will be no limited operating periods for the NSO for this project. In the case that a spotted owl is detected then LOPs will be established for this species.

There will be a 300 foot buffer around Pinnacle Rock and an unnamed rock outcrop (Guano Cave) near South Fork Long Valley Creek from May 15 – August 15 to protect roosting bats from disturbance by noise.

Snag Retention

Snags are important for a variety of species on the Mendocino National Forest including pileated woodpecker, hairy woodpecker, and other cavity nesting birds. Although there are plenty of snags post-fire available on the landscape it is important to locate and maintain the most viable snags for these species that will last for several years as it may be hundreds of years before there are snags available to replace these snags when they fall.

The Mendocino National Forest LRMP has a habitat capability model for snags and can be found in Appendix E. For this project we will be maintaining optimum snag habitat. The forest plan recommendations are described in Table 3. The Mendocino will be looking to clump snags when possible as it is more suitable to the preference of woodpeckers to have snags closer together. Hard to soft ratio for snags is not likely to be met as any soft snags were removed during the fire. If there are soft snags remaining and they do not pose a hazard they should be maintained. A variety of species of snags will be targeted.

TABLE 3: SNAG RETENTION GUIDELINES FROM THE MENDOCINO LAND AND RESOURCE MANAGEMENT PLAN 1995 FOR MONTANE CONIFER

Habitat Variable	Optimum	Sub-optimum	Low
Average density **…15-24" DBH** **…>24" DBH** **…Total**	 >3.0/acre >0.5/acre >3.5/acre (max 10/acre)	 1.2-3.0/acre 0.2-0.5/acre 1.4-3.5/acre (max 5/acre)	 <1.2/acre <0.2/acre <1.4/acre (max 3/acre)
Height	>40 feet	20-40 feet	<20 feet
Dispersion	One group per 5 acres or less, with 15+ snags	One group per 5-15 acres, with 5-15 snags	Even dispersion
Hard:Soft Ratio	>3:1	2:1-3:1	<2:1
Location	Edges of meadows, brushfields, streams, and other water	Throughout wooded stands	Rocky, open slope, Barren areas
Species	Douglas fir, Gray pine, Ponderosa pine, black oak, blue oak, madrone	White oak, live oak	

Pileated woodpecker is discussed in the Management Indicator Species report, but these snag requirements will provide for pileated woodpecker habitat as well as other species of woodpeckers found on the Mendocino National Forest.

Course Woody Debris (CWD) Retention

Although the NSRP will remove some of the dead and down CWD from the project area there is a requirement to maintain 5 to 20 tons/acre of course woody debris comprised of a minimum of four recently downed logs per acre. When present, focus retention on logs equal to or greater than 20 inches in diameter (large end), or the largest diameter logs available. Retained logs should range from 15 to 20 feet in length, with one log per acre greater than 20 feet in length.

Fuels treatments propose leaving between 5 – 20 tons/acre of down course woody material. This amount was indicated to be the optimum quantity of CWD for wildlife in warm dry ponderosa pine and Douglas-fir types (Brown et.al 2003). Retaining this amount of CWD will allow the forest to maintain legacy components needed for forests to develop into stands that are variable and complex.

Roads and Log Landings

There will be no new road or log landings construction with this project. Only existing roads and log landings will be used.

Herbicide application

The application of herbicides requires a careful assessment of risk to terrestrial and aquatic wildlife. The primary pathways by which herbicide application can result in unintended negative consequences in areas outside the area treatment is drift and runoff. Drift is the airborne movement of herbicides, usually associated with mechanical application techniques such as sprays. Runoff is the transport of herbicides in water, generally associated with rain, across the landscape and potentially into waterways. A number of factors influence the likelihood of herbicide transport via these pathways, including weather conditions (such as wind or rain) as well as soil types.

The effects analysis for each species (analyzed below) assesses the risk of applying aminopyralid, triclopyr, imazapyr, and fluazifop (all would be mixed with a non-ionic methylated seed oil surfactant and marker dye). Information and procedures used to assess risk were derived from two sources. The first source is a process developed by the USFS for analyzing risk associated with the use of a specific pesticide, which involves a set of application criteria to minimize risk (see Invasive Plant Management design criteria Appendix C of EA). The second source is a risk assessment spreadsheet procedure developed by
Syracurse Environmental Research Associates, Inc. Using the spreadsheet procedure, risk is assessed by comparing a potential exposure dose with the daily reference dose (RfD) established by the U.S. EPA, which is a level of exposure at or below which no acute or chronic health effects are expected to occur. Risk is expressed in the form of a hazard quotient, which is computed as the ratio of proposed exposure dose to the RfD. Hazard quotients $\leq$1.0 are considered to pose insignificant risk to human health or the environment. Each herbicide-specific spreadsheet analyzes four human and five environmental (plant and animal risk potentials) (SERA 2007b, 2014b, 2011b, 2011d).

The risk assessments are based upon Human Health and Ecological Risk Assessment reports prepared by Syracuse Environmental Research Associates (SERA 2007a, 2014a, 2011a, 2011c) which utilize the best available science to describe the level of herbicide expected to be introduced, persist, and transport

within the forest environment and to evaluate the likelihood of adverse ecological effects. The majority of current understanding about the effects of herbicides is based upon laboratory experiments on a few model organisms, or model tissue or cell lines. When specific data on aquatic species is lacking (e.g., amphibians), the risk assessments extrapolate to similar types of species, in this situation fish. Because of the inherent error and unknowns in extrapolating to other species not specifically studied, the Forest Service uses the most sensitive endpoint from the most sensitive species tested as the toxicity index for aquatic species. However, this method does not completely alleviate the possibility that some species are particularly sensitive to one or more herbicides.

In the SERA Risk Assessments, risk is expressed as hazard quotients, which is the ratio of the anticipated level of the exposure to EPA reference doses for acceptable exposure. Hazard quotients less than 1.0, indicate that the exposure poses little reason for concern. Hazard quotients nearing 1.0 pose a greater reason for concern. Hazard quotients are developed during NEPA for each type of herbicide in each project as an accidental spill, peak Estimated Environmental Concentration (EEC), and longer-term EEC (which gives chronic effects from herbicide exposure).

The invasive plant treatment sites comprise a total of 433 acres. The proposed herbicides are aminopyralid, triclopyr, imazapyr, and fluazifop. These chemicals would all be applied at or below the label rates and mixed with a non-ionic methylated seed oil surfactant and a marker dye. All chemicals would be applied with a backpack sprayer (see Appendix C in North Shore EA for Invasive Plant Management and herbicide use design criteria)

Release Treatments: Release treatments are needed to allow the tree seedlings to become established before the shrub component will overtop and out compete the seedlings. Release treatments (which can consist of mastication, hand grubbing or herbicides) may be utilized where planting seedlings in the plantation units, salvage units, and along the roads where hazard trees were removed in the previous Bartlett Roadside Hazard Tree Removal Project. There are approximately 1203 acres (38% of 2598 acres, see Silviculture Report pg. 30) that may require release treatments (which may include herbicide use). If herbicide is selected for release treatments, triclopyr will be used (again see Appendix C of North Shore EA for design criteria for herbicide use).

Alternative 3 – Proposed action with use of herbicides for invasive plant treatment only, except in research plots which would incorporate herbicides for release treatments.

Alternative 4 – Proposed action with no herbicides.

Existing Environment

Species Accounts

Threatened & Endangered

Northern Spotted Owl

Northern spotted owls inhabit Douglas-fir, western hemlock, grand fir, white fir, ponderosa pine, Shasta red fir, mixed evergreen, mixed conifer hardwood, and redwood forest types. Spotted owls typically use older forest habitats that contain the structures and characteristics for nesting, roosting, and foraging. These characteristics include high canopy closure (60-90%), a multi-layered, multi-species canopy with large overstory trees (DBH > 30”), a high incidence of large trees with various deformities (large cavities, broken tops, mistletoe infections, and other evidence of decadence), large snags, large accumulations of

fallen trees, and other woody debris on the ground, and sufficient open space below the canopy for flight. Foraging habitat will have similar characteristics as nesting and roosting, but it may not always support a successfully nesting pairs of owls. Dispersal habitat usually consists of habitat of adequate tree size and canopy closure to provide protection from predators and minimal foraging opportunities (USFWS 2011).

The Private Timberland Guidelines prepared by FWS provide recommendations for the amount of nesting/roosting and foraging habitat needed for a home range and core area in a spotted owl territory. Within a home range (excluding the core area) it is recommended there be 935 acres of total foraging habitat. Within a core area it is recommended there be at least 250 acres of nesting/roosting habitat and at least 150 acres of foraging habitat.

Prey for northern spotted owls in the California Coast Provinces is mainly the dusky-footed woodrat. Other important prey, depending on location, include deer mice, tree voles, red-backed voles, gophers, snowshoe hare, bushy-tailed woodrats, birds, and insects (USFWS 2011). Dusky-footed woodrats usually choose low laying areas near water sources, but may be found along hillsides. They avoid open areas with limited underbrush. On the Mendocino National Forest the best protection for a woodrat is live oak (Bonadio 2000).

Parts of the North Shore project area were previously treated during the Lakeview Hazardous Fuels Reduction project in 2013 and all northern spotted owl habitat was maintained at its current designation. There was a may affect, not like to adversely affect call for northern spotted owl. The Lakeview project used a variety of treatment types to reduce fuels including prescribed fire; noncommercial, pre commercial, and commercial thinning; hand and machine piling, and mastication; and fuel break construction on about 2,444 acres. The project completed a fuel break and prescribed fire within two 100-acre Late Successional Reserves (4040 and 4041) and affected about 67 acres of NSO foraging habitat. This project was intended to reduce catastrophic wildlife in the LSRs and protect NSO habitat but not all treatments had been implemented and under the conditions of the Ranch Fire the implemented treatments were not enough to protect NSO habitat.

Most science agrees on the habitat used by northern spotted owls: older forests that contain structures and characteristics required for nesting, roosting, and foraging. These characteristics include moderate to high canopy cover, multi-layered, multi-species canopy with large overstory trees, a high incidence of large trees with deformities, large snags, accumulations of logs and other woody debris, and sufficient open space below the canopy to fly (USFWS 2011). When it comes to the removal of these characteristics by stand-replacing, high-severity wildfires there seems to be disagreement on the use of those previously suitable areas by spotted owls, especially when the post-fire treatments is salvage logging.

The North Shore area, about 40,000 acres, burned in one 24 hour period and RAVG for this area indicated 1816 acres burned at low, 4671 acres burned at moderate, and 30,608 acres burned at high following the Ranch Fire. This area was already poor quality for NSO with the forest plan designating the area as dispersal. There are three 100 acre LSRs but they were also of lower quality habitat prior to the fire.

It is likely that this area will not currently support spotted owls due to the loss of canopy cover and consumption of coarse woody debris. Bond et al. 2016 mention that intense fire that causes loss of

closed canopy forests and exceptionally large areas burned by intense fire during extreme weather may cause abandonment of lower quality owl sites. This is likely the case in the North Shore area where 30,000 acres burned at high severity in already marginal NSO habitat.

For the North Shore project, field visits were made to determine accuracy of post-fire habitat. For the Bartlett Hazard Tree Abatement project there was not time to assess the post-fire habitat that was generated by Yreka FWS. For the North Shore project there is no remaining nest/roost habitat, 1,687 acres of dispersal habitat, and 605 acres of foraging habitat. Downgrading of habitat types occurred due to the Ranch Fire itself and does not include suppression actions (Table 4).

The North Shore analysis buffer (1.3 miles surrounding the 40,000 acre project area) overlaps land south of the forest boundary which includes the towns of Nice and Lucerne and BLM administered land. The areas outside of the Forest Service lands that fall within the analysis buffer, but outside of the project area, are not included in this analysis. The portions of the analysis buffer that fall within Forest Service jurisdiction is 8,763 acres (this is the 1.3 mile buffer surrounding the project area and does not include the project area). Within these 8,763 acres there are 514 acres of dispersal, 150 acres of foraging, and 52 acres of nesting/roosting habitat. These areas (outside of the project area) have not been field verified but are based on Google Earth imagery. See Table 4 below for breakdown of acres.

(See North Shore Restoration Project BA for more details regarding NSO)

Forest Service Sensitive Species

Northern Goshawk

Northern goshawks nest in a variety of forest types, ages, structural conditions, and successional stages (Reynolds et al. 1992). Optimum habitat for the goshawks consists of conifer/hardwood, mixed conifer, red fir, or white fir composed of trees 24" DBH or greater and a canopy closure 40% or greater. Goshawks will also use trees 12-24" DBH with canopy cover as low as 20%. Nests are generally at the bottom of the northern slope where adults can perch above the nest to see into the nest. Nest are also close to water and openings suitable for foraging (>0.1 acre in size) (USFS 1995).

Prey for the northern goshawk are ground and tree squirrels, rabbits and hares, large passerines, woodpeckers, game birds, and corvids, occasionally reptiles and insects (Squires and Reynolds 1997). Their diet may vary seasonally due to differences in timing of migration, hibernation, or periods of inactivity among prey species, the cyclic nature of some prey species, or difference in food preferences among goshawks (Reynolds et al. 1992).

Bald Eagle

Optimum breeding season habitat for eagles is conifer/hardwood, Douglas fir, mixed conifer, or ponderosa pine with greater than 20% crown closure. Nests are generally found in mature or old-growth trees such as dominant sugar and ponderosa pines with large limbs and open crowns, snags, cliffs, rock promontories, and rarely on the ground or on human-made structure such as power poles and communication towers (USFWS 2007).

Bald eagles require large bodies of water and/or free-flowing rivers with adjacent snags or other structures for perching. They are opportunistic feeders and fish comprise most of their diet but they also prey on waterfowl, shorebirds/colonial water birds, small mammals, turtles, and carrion. Ideal nest sites are no more than a mile from a foraging area (USFS 1995).

Fisher

Fishers were historically distributed throughout the mature and old growth forest on the Mendocino National Forest (USFS 1995). They inhabit large areas of mature mixed conifer forests, specifically closer to streams, farther from openings, with large trees, dense canopy closure, and a high density of snags (Beyer and Golightly 1996). Optimum denning/resting habitat consists of old-growth and/or mature conifer, mixed conifer/hardwoods, and/or hardwoods. Foraging habitat consists of mid-successional habitat of the same species as denning/resting habitat. A heterogeneous forest structure is important for fishers in denning, resting, and foraging habitats. The Mendocino LRMP (1995) suggests 3-4 layers for high quality habitat and 2-3 layers for moderate habitat, plus shrubs.

After the 2018 Ranch Fire there is little suitable habitat remaining for fishers. There is low quality habitat available in small patches in areas that were treated during the Lakeview project in 2013. These areas received lower severity fire during the Ranch Fire. There are no known sightings of fishers within the project area. This area could be used by fishers for dispersing but the forest plan does not specify fisher use in the management areas (Bartlett, Ruppert, and Middle Creek) within the project area.

Pallid Bat

Pallid bats are common in desert habitats but they may also be found in oak and pine forests or open farmland (Weber 2009) but in some areas in California they may be using mixed conifer and evergreen habitats. Bats in California use day or night roosts that may be live trees or snags, rock crevices or buildings with day and night roost sites alternating (Baker et al. 2008).

Pallid bats are gleaners and forage close to the ground (Baker et al. 2008). They prey on large flying and ground-dwelling insects, including beetles, crickets, katydids and grasshoppers, cicadas, moths, spiders, scorpions, and centipedes. Occasionally they will take small lizards and mice (Weber 2009).

Townsend's Big-eared Bat

Townsend's big-eared bats use a variety of habitats and is strongly correlated with the availability of caves or cave-like roosting habitat associated with deciduous and coniferous forests. This is a colonial species with relatively restrictive roost requirements. The most significant roosts, which have the largest aggregations and are most critical to the survival of populations, are the winter hibernacula and the summer maternity roosts.

They will use cave, mines and abandon buildings for maternity roosts and hibernacula, and have been known to use abandon bridges and large tree cavities for day and night roosts. This species does not roost in crevices but rather on exposed surfaces, often close to the entrance of the cave making them extremely vulnerable to disturbance. Colonies use multiple roosts, shifting as the season progresses and temperatures change.

Females congregate in nursery colonies of a few dozen to several hundred individuals, and exhibit high site fidelity. Breeding takes place in August-November and, with delayed implantation the young (1 per year) are born in May or June. Females can breed in their first year. Young are weaned by mid to late August.

In colder parts of California, the bats seek hibernacula conditions for prolonged torpor. Roost temperatures are often just above freezing and the relative humidity is high (84-94%) to reduce moisture loss (Humphrey and Kunz 1976). In areas with more moderate climate, the species arouses

from torpor frequently to feed (Pierson et al. 1999). They may change roost sites frequently. They tend to roost in small groups in sites with temperatures below 10 degrees C, strong airflow and lower relative humidity. Disturbance at hibernacula can cause the colony to arouse, impacting their energy reserves to the point where they may not survive the winter (Pierson et al. 1999)

This species is insectivorous, with 95% of diet consisting of Lepidoptera (moths). They are sensitive to timber harvest and salvage operations, which reduces habitat for prey. They are late flyers, emerging only after full darkness.

Fringed myotis

The fringed myotis is found in western North America from south-central British Columbia to central Mexico and to the western Great Plains (Naturserve 2012). In California, it is distributed statewide except the Central Valley and the Colorado and Mojave Deserts (CWHR 2008).

The fringed myotis roosts in crevices found in rocks, cliffs, building, underground mines, bridges, and in large, decadent trees (Weller and Zabel 2001). In general, this species is found in open habitats that have nearby dry forests and an open water source (Keinath 2004). Bats mate in the fall and deliver one offspring between May and July (CWHR 2008). Like many cave roosting species, fringed myotis colonies are susceptible to disturbance in hibernacula and maternal colonies (CWHR 2008). The species uses caves, crevices, mines and building for roosting, hibernacula, and maternity colonies (Keinath 2004; CWHR 2008). They day and night roost under bark and in tree hollows and in northern California they day roost in snags only (Keinath 2004; Weller and Zabel 2001). Medium to large diameter snags are important day and night roosting sites (Weller and Zabel 2001).

In California, this species is found from 4,265 to 7,220 feet in elevation in pinyon-juniper, valley foothill hardwood and hardwood-conifers (CWHR 2008). There is increased likelihood of occurrence of this species as snags greater than 30 cm in diameter increases and percent canopy cover decreases (Keinath 2004). Large snags and low canopy cover, typical of mature forest habitat types offer warm roost sites (Keinath 2005). Open water sources may include artificial sources, such as stock tanks and ponds, in addition to natural sources (Keinath 2004).

Home range size varies with insect abundance, increasing as the number of available insects decreases. Keinath (2004) reports study averages about 100 acres. Travel distances from roosting to foraging areas are up to eight kilometers. The fringed myotis consumes primarily beetles and is supplemented by moths and fly larvae (Keinath 2004) captured in the air and on foliage (CWHR 2008). Little is known about predation, but it is not suspected to significantly affect fringed myotis populations (Keinath 2004).

Pacific Marten

Marten inhabit multi-storied mature and old growth mixed conifer forests on the Mendocino National Forest (USFS 1995). They prefer areas with large trees, dense canopy cover, and areas with snags and coarse woody debris (USFS 1995, Beyer and Golightly 1996). Snags, live trees with deformities, and down wood are important features for den and rest sites, as well as protection from predators (Bull et al. 2005, Lofroth et al. 2010, USFWS 2004).

After the 2018 Ranch Fire there is little suitable habitat remaining for marten. There is low quality habitat available in small patches in areas that were treated during the Lakeview project in 2013. These areas received lower severity fire during the Ranch Fire. There are two marten sightings from 2017 and

an unknown date. This area could be used by martens for dispersing but the forest plan does not specify marten use in the management areas (Bartlett, Ruppert, and Middle Creek) within the project area.

Foothill Yellow-legged Frog

The foothill yellow-legged frog occupies shallow portions of perennial streams and rivers with cobble-size substrate within open, sunny banks, in forests, chaparral, and woodland habitats (Californiaherps.com 2000, Jennings and Hayes 1994). Forest habitats include valley-foothill hardwood, valley-foothill hardwood-conifer, valley-foothill riparian, ponderosa pine, mixed conifer, coastal scrub, mixed chaparral, and wet meadow types (CWHR 2008). Gravel and cobble river bars along riffles and pools with at least 20% shading seems to be preferred by sub-adults and adults (Ashton et al. 1998). Breeding habitat is typically classified as a stream with riffles containing cobble-sized or larger rocks as substrate (Zeiner 1990). Frogs may also be found in moderately vegetated backwaters, isolated pools, and slow moving rivers with mud substrates (Ashton et al. 1998).

Western Pond Turtle

The pond turtle is a habitat generalist occurring in in permanent and ephemeral habitats below 2500 ft in elevation (USFS 1995). Turtles have been sighted in rivers, streams, lakes, ponds, permanent and ephemeral wetland habitats, and altered habitats including reservoirs, abandoned gravel pits, stock ponds, and sewage treatment plants. Holland (1994) found that observations made in the altered habitats tend to be turtles that have been displaced by the destruction of natural habitats. Terrestrial habitats are less understood. In southern California animals spend only one to two months in terrestrial habitats while animals in the northern portions of the range can be terrestrial for up to eight months (Lovich and Meyer 2002). Turtles have been documented to overwinter under litter or buried in soil in areas with dense understories consisting of vegetation such as blackberry, poison oak and stinging nettle which reduces the likelihood of predation (Davis 1998).

Pacific Lamprey

Pacific Lamprey historically occupied the reaches of Upper Cache Creek within the project area and currently these reaches provide suitable habitat. However access to this area is currently blocked by diversion structures at the Yolo Bypass, Cache Creek Settling Basin, and Capay dam. Flows are also seasonal and Cache Creek only connects with the mainstem of the Sacramento in abnormally wet years (Goodman and Reid, 2018).

Western Brook Lamprey

Western Brook Lamprey occupy the Eel River drainage and Clear Lake/Cache Creek drainages. A distinct population is found in Kelsey Creek, upstream of Clear Lake. However access to this area is currently blocked by diversion structures at the Yolo Bypass, Cache Creek Settling Basin, and Capay dam. Flows are also seasonal and Cache Creek only connects with the mainstem of the Sacramento River in Abnormally wet years (Goodman and Reid, 2018).

Clear Lake Hitch

Clear Lake hitch are a cyprinid species endemic to Clear Lake. Clear Lake hitch use low gradient sections of Clear Lake tributaries to spawn in spring and early summer. Juveniles typically occupy these tributaries for 1-3 months before migrating to the deeper waters of the lake. Adult hitch remain in the lake only returning to tributaries to spawn.

Hardhead

Hardhead are a cyprinid species native to California and historically found within the Upper and Lower Cache Creek watersheds. The last documented occurrence of hardhead within Cache Creek was in 1997. A repeated survey effort in 2008 found no hardhead present. Variable flows and fish passage barriers at Capay Dam are believed to impact hardhead abundance in the upper reaches of Cache Creek (Cache Creek Fisheries Survey 2008 Technical Report).

Effects of No Action

Direct and Indirect Effects

Taking no action in the short term would result in no direct effects to listed, proposed, or sensitive species or habitats pertaining to these species. No potential human-caused disturbance would result due to a lack of proposed management such as those described for the action alternatives.

Indirectly, the no-action alternative would maintain habitats in existing conditions and trends. There would be no immediate change in snag density or recruitment of large snags. In addition, current conditions would remain, and no habitat restoration would occur. However, without treatment and in the long term, fuels levels would increase due to fire killed trees falling, resulting in larger re-burn potential (Fire and Fuels Report pg 2), and non-native invasive plant species would continue to reduce diversity, thus suitable habitat, within the project area (this would hold true for Alternative 4 as well – no herbicide use). The fuels report prepared for this project indicates that risk of high fire severity would increase in ten years post-fire for much of the fire area and that project activities are likely to reduce the size and impact of future reburns in the project area, thus allowing the forests time to regrow.

Effects of Action Alternatives

Northern Spotted Owl

For this analysis, studies of all views regarding the use of burnt landscapes by spotted owls are considered. These studies tend to only cover a short time frame and that means projects and managers must take risks when treating post-fire areas due to the lack of long-term effects analysis. These risks are taken with the best interest of the spotted owl and its habitat needs in mind. It is also important to remember that the habitat removed by the fire will take time and energy to restore and is a long-term process with short term impacts. For analysis of the project actions these studies are considered with respect to the multiple uses of the Mendocino National Forest such as wildlife habitat, recreation, as well as economics and many other resources provided to the public. Pre-fire habitat and previous occupancy is also strongly considered during analysis and what the end goal is for restoring the habitat on the landscape.

Direct Effects

The Proposed Action for the North Shore project area includes the use of herbicides for release and invasive plant species. The proposed actions adhere to Recovery Action 12 in the northern spotted owl recovery plan. Recovery action 12 states, “In lands where management is focused on development of spotted owl habitat, post-fire silvicultural activities should concentrate on conserving and restoring habitat elements that take a long time to develop (e.g. large trees, medium and large snags, downed

wood)." In the case of the North Shore project 'lands where management is focused on developing spotted ow habitat' would be the 100 acre LSRs.

There are about 592 acres proposed for commercial salvage operations and about 1617 acres of reforestation units. Within the salvage units there are no acres of nesting/roosting habitat, 44 acres of foraging habitat, and 71 acres of dispersal habitat.

In the 100 acre LSRs there is 80 acres of 4040 and 18 acres of 4041 proposed for salvage. In the reforestation units there are no acres of nesting/roosting, 20 acres of foraging, and 82 acres of dispersal habitat and 19 acres of the 100 acre LSR 4040.

One of the purposes of the project is to protect remaining areas of unburned vegetation and other residual legacy elements which would therefore protect and retain remaining stands that are or could become habitat for northern spotted owls or their prey. Again, the remaining foraging and dispersal habitat found within these areas proposed for treatment will remain unchanged (the marking guidelines will not remove trees that contribute to this habitat type). The remaining habitat is not likely extensive enough for NSO use as they are small in size and there is very little connectivity in between.

TABLE 4: PRE-TREATMENT AND POST-TREATMENT ACRES

Habitat	**Pre-treatment Acres**			**Post-treatment Acres**		
	Action area 8763 acres (1.3 mile buffer around the project area)	Project area 40,000 acres		Action area 8763 acres (1.3 mile buffer surrounding the project area)	Project Area 40,000 acres	
			Salvage unit acres			Salvage unit acres
Nesting/Roosting	52	0	0	52	0	0
Foraging	150	605	44	150	605	44
Dispersal	514	1687	71	514	1687	71

Although there are not currently any known spotted owls using the North Shore project area for reproduction the proposed action and its use of salvage logging will drastically alter the landscape in addition to the changes from the Ranch Fire. Salvage logging may prolong the development of late successional habitat, but on the other hand the reforestation of the salvage units and other areas will hopefully expedite the development of late successional habitat where appropriate. We also need to consider the fact that in the face of climate change this area may not support late successional habitat anymore.

Indirect Effects

The use of herbicides to release planted trees and reduce the competing vegetation in the understory will reduce the habitat available for northern spotted owl prey. On the other hand there will likely be

more chaparral and early successional habitat available for prey species due to the severity and expanse of the Ranch Fire.

Due to the expanse of the Ranch Fire and its high basal area lost within and around the project area it is unlikely that owls are foraging within the project. We cannot say this with certainty though and owls may fly into the area in search of suitable habitat. The next nearest activity centers are about 3 miles north of the project area, LAK0028 (4045) and LAK0029 (4046). LAK0028 was established in 1992 on a single owl sighting and LAK0029 was also established in 1992 but only on an audible response. Spotted owls may use burned areas to forage and it is suspected that is the case because of the increase in prey abundance after a fire (4 years post fire in Bond et al 2009, 3-4 years post-fire in Bond et al 2016). However, due to the extensive areas of high severity fire it is unlikely that owls would be flying the distance from the nearest nesting/roosting habitat to forage in the North Shore project area

Exposure to Herbicides: Because of the extremely limited suitable habitat for NSO within the project area and the distance to the closest potential suitable habitat (about 6 miles), there should be no risk of exposure to this species or to their prey. To disclose possible impacts to the owl, if present, the potential for direct toxicological effects to the spotted owl is negligible for the proposed use of aminopyralid, triclopyr, imazapyr, and fluazifop based on acute and chronic exposure scenarios involving the consumption of contaminated mammalian prey and contaminated water by a carnivorous bird. Likewise, the chronic exposure scenarios involving contaminated water do not suggest direct toxicological impacts. Potential ingestion of contaminated prey is the greatest concern to the NSO. However, there is little potential risk from owls eating contaminated mammals as none of the hazard quotients are above 1. Furthermore, it is unlikely that 100% of the owl's diet would contain contaminated prey, given their large home range relative to the work area for herbicide application in a particular season. Given the low risk associated with these herbicides to raptors, use of herbicides for the proposed action (or other alternatives including the use of herbicides) would not impact individual owls even if suitable habitat was present (SERA 2007b, 2014b, 2011b, 2011d).

Cumulative Effects

Within the North Shore project the Mendocino National Forest is also treating roadside hazards under the Bartlett HTA categorical exclusion (CE). Under this CE there is a no effect determination to Northern spotted owl and LOPs were set in place. There are LOPs for the Bartlett CE because there was not time to field verify the habitat prior to needing to mitigate hazards to the public and Forest Service employees. Because there is no effect from Bartlett HTA there will be no cumulative impacts to the North Shore Restoration project.

There were three Emergency Timber Harvest Plans (THP) proposed in 2019 within the North Shore project area ranging from 92 to 640 acres. The North Shore project's impacts should have little to no impact on spotted owls and not create adverse effects when combined with private land activities.

Northern Goshawk

Direct Effects

There will be no direct effects to the northern goshawk due to actions taken in the project area. The proposed activities will not alter or reduce suitable habitat for this species. There are no known nests within the project area and only one recorded sighting from 1990. This area likely only provided dispersal habitat for northern goshawk prior to the fire.

Indirect Effects

Goshawks may be indirectly affected by the project as habitat for their prey is removed or enhanced. Burnt trees that may be used by woodpeckers that are goshawk prey may be removed while understory shrubs may be growing and enhancing habitat for small mammals that are prey.

Use of herbicide could result in goshawks exposure to herbicide residue or contaminated prey. The potential for direct toxicological effects to the goshawk is negligible for aminopyralid, triclopyr, imazapyr, and fluazifop based on acute and chronic exposure scenarios involving the consumption of contaminated mammalian prey and contaminated water by a carnivorous bird. Likewise, the chronic exposure scenario involving contaminated water did not suggest any direct toxicological impact. There is little potential risk to raptors eating contaminated mammals as none of the hazard quotients are above 1 and it is unlikely that 100% of the goshawk's diet would contain contaminated prey. Given the low risk, use of these herbicides would not impact individual goshawks (SERA 2007b, 2014b, 2011b, 2011d).

Cumulative Effects

Because there are no direct or indirect effects anticipated by management actions (salvage, fuels, herbicide use) on public or private land, no cumulative effects are anticipated by any of the proposed actions.

Bald Eagle

Direct Effects

There will be no direct effects to bald eagles because there are no known eagle nests within the North Shore project area.

Indirect Effects

Indirect effects may include the removal of snags used for perching and resting. However, there are snag retention guidelines in places to ensure that there are higher quality snags remaining on the landscape for bald eagle roosts and there will be numerous snags remaining across the landscape post salvage treatment, so indirect effects will be minimal to none.

Herbicide use could result in eagle exposure to herbicide residue or contaminated prey. The potential for direct toxicological effects to the eagle is negligible for the use of aminopyralid, triclopyr, imazapyr, and fluazifop based on acute and chronic exposure scenarios involving the consumption of contaminated fish by a fish-eating bird, and bird consumption of contaminated drinking water. These exposure scenarios produced hazard quotient values that were below the level of concern which indicates the toxicological risk posed by the use of the proposed herbicides is negligible. Potential ingestion of contaminated prey is the greatest concern to the eagle. However, there is little chance of eagles being affected by the contamination of herbicides. Even if 100% of the bald eagle's diet was composed of contaminated prey, the hazard quotient would be less than 1 (SERA 2007b, 2014b, 2011b, 2011d).

Cumulative Effects

Because there are no direct or indirect effects anticipated by management actions (salvage, fuels, herbicide use) on public or private land, no cumulative effects are anticipated by any of the proposed actions.

Bats

Direct Effects

Bats may be affected by the salvage of trees that have sloughing bark that may be used as a roost. The proposed action would salvage merchantable trees on 592 acres. Steel et al. (2018) were not able to conclude that salvage logging negatively affected snag roosting bats because their acoustical surveys were better suited to detect foraging bats. Hayes and Loeb (2010) (as cited in Steel et al. 2018) concluded that removing snags would remove potential roost sites for bats.

Steel et al. (2018) suggest that for short-term benefits the retention of large trees and snags would help maintain roosting sites. There are snag retention guidelines in place that will help maintain roost structures on the landscape. Outside of treatment units there will also be a plethora of snags available for roosting bats.

Around rock outcrops that may or may not be used by bats will also have vegetation retention guidelines to protect microclimates of the outcrops.

Indirect Effects

Buchalski et al. (2013) cited studies that suggest bats are resilient to landscape scale fire because the fire removes vegetation and litter that may hinder bats from foraging and that may disrupt echolocation. By removing snags, small diameter trees, and understory vegetation foraging opportunities may be further improved for bats (Hayes and Loeb 2010 in Steel et al. 2018, Steel et al. 2018).

There will be a 300 foot buffer around Pinnacle Rock and an unnamed rock outcrop (Guano Cave) near South Fork Long Valley Creek from May 15 – August 15 to protect roosting bats from disturbance by noise. This project may impact individual bats but will not cause a trend toward listing for Townsend's big-eared bat, pallid bat, or fringed myotis.

Effects from herbicide treatments – The potential for direct toxicological effects to bats from proposed herbicide treatments are based on acute and chronic exposure scenarios involving direct exposure and the ingestion of contaminated water and insects by small mammals. These exposure scenarios produced hazard quotient values below the level of concern indicating the toxicological risk posed by the use of the herbicide is negligible. Given the low risk associated with this herbicide to bats, use of aminopyralid, triclopyr, imazapyr, or fluazifop would not impact individuals (SERA 2007b, 2014b, 2011b, 2011d).

Cumulative Effects

Due to the extent of suitable snags that will be left within the project area (post treatment), the designation of LOPs around Pinnacle Rock and an unnamed rock outcrop near South Fork Long Valley Creek (May 15 – August 15) and the limited projects on going on private land within the planning area, no cumulative effects are anticipated for the Townsend's big-eared bat, pallid bat, or fringed myotis.

Fisher and Pacific Marten

Direct Effects

There will be no direct effects to either the fisher or marten as a result of this project. This area is not likely inhabited by denning individuals. Any fisher or marten seen in this area are likely dispersing individuals. This project would not alter or reduce suitable habitat for this species.

Indirect Effects

from herbicide treatments – In the unlikely event that fishers or martens were exposed to herbicide residue or contaminated prey and potential ingestion of contaminated prey would be the greatest concern. The potential for direct toxicological effects is negligible for the use of aminopyralid, triclopyr, imazapyr, and fluazifop based on acute and chronic exposure scenarios involving a medium-sized carnivore's consumption of contaminated small mammals or water. These exposure scenarios produced hazard quotient values below the level of concern indicating the toxicological risk posed by the use of the herbicide is negligible. Given the low risk associated with this herbicide to marten, use of herbicides would not impact individuals (SERA 2007b, 2014b, 2011b, 2011d).

Cumulative Effects

Because there are no direct and a very limited possibility of indirect effects are anticipated by management actions (salvage, fuels, herbicide use) on public or private land, no cumulative effects are anticipated by any of the proposed actions.

Foothill Yellow-legged Frog and Western Pond Turtle

Direct Effects & Indirect Effects

There will no direct or indirect effects to Foothill yellow-legged frogs or Western pond turtles from the proposed action. All commercial timber plots will have riparian reserves and stream side management zones in place which will prevent direct degradation on habitat. There will be no direct or indirect impacts to Foothill yellow-legged frogs or Western pond turtle from the use of herbicides. SERA risk assessments were reviewed and indicate that at proposed application rates, the estimated doses from the exposure scenarios are all less than the reported NOAEL (no-observable adverse effect level) for all herbicides. There are no acute or chronic exposure scenarios at application rates described in the Proposed Action that will result in a Hazard Quotient (HQ) above one for amphibians. See North Shore Restoration Project (NSRP) EA, Appendix B for a list of design criteria and BMPs.

Cumulative Effects

Because there are no direct or indirect effects anticipated as a result of management actions on public or private lands, no cumulative effects are anticipated by the proposed actions.

Pacific Lamprey, Western Brook Lamprey, and Hardhead

Direct Effects

There will be no direct effects to Pacific lamprey, Western brook lamprey, or hardhead from the proposed action. Although streams within the project area are within the historic range of these species, downstream barriers to fish passage and intermittent connectivity to the Sacramento River currently prohibit them from occupying these streams.

Indirect Effects

There will be no indirect effects to Pacific lamprey, Western brook lamprey, or hardhead from the proposed action. While suitable habitat is present within the project area no individuals of these species have occupied these reaches in recent history.

Cumulative Effects

Because there are no direct or indirect effects anticipated as a result of management actions on public or private land, no cumulative effects are anticipated by the proposed actions.

Clear Lake Hitch

Direct Effects

There will be no direct effects to Clear Lake hitch from the proposed action. Clear Lake hitch spawn in inundated streams which terminate into Clear Lake in spring and early summer. Best management practices will be followed to ensure increased sedimentation does not occur within the watershed (North Shore Restoration Hydrology Report, 2020 Page 41). There will be no direct or indirect impacts to Clear lake hitch from the use of herbicides. SERA risk assessments were reviewed and indicate that at proposed application rates, the estimated doses from the exposure scenarios are all less than the reported NOAEL (no-observable adverse effect level) for all herbicides. There are no acute or chronic exposure scenarios at application rates described in the Proposed Action that will result in a Hazard Quotient (HQ) above one for fish.

Indirect Effects

Clear lake hitch could be indirectly affected by water drafting associated with this project.
Water drafting for dust control shall be taken from Clear Lake. Water drafting pumps should not exceed 350 gpm and screening devices shall be used to minimize any impacts to Clear Lake hitch. Screen mesh openings should not exceed 3/32 inch in diameter.

Cumulative Effects

Because there are no direct and a very limited possibility of indirect effects are anticipated by management actions (salvage, fuels, herbicide use) on public or private land, no cumulative effects are anticipated by any of the proposed actions.

Determinations

Northern Spotted Owl

The North Shore project may affect, but is not likely to adversely affect northern spotted owl because of the following:

1) There are no valid NSO territories within the analysis area of this project and there is no suitable nesting/roosting NSO habitat within the project area.
2) All suitable foraging and dispersal habitat will be maintained. No suitable NSO habitat will be downgraded or removed (see table 6).
3) Protection of remaining areas of unburned vegetation and other residual legacy elements will serve as remnant wildlife structure as the area transitions through seral stages.
4) The snag and coarse woody debris retention guidelines will provide for potential foraging perches and prey habitat if NSO are using the area to forage.
5) Use of herbicides/mechanical/hand treatments to release planted trees may reduce the shrub understory habitat for prey species.
6) Because of potential disturbance (noise and smoke) produced by large landscape scale fuels treatments proposed within the project area.
7) There is no nest/roost habitat within 0.25 miles of the project area.
8) Given the low risk associated with herbicide, use of herbicides would not affect individuals.

Northern Goshawk

The North Shore project will have no impact on the northern goshawk as there are no known nests within the project area and only one recorded sighting from 1990. This area likely only provided dispersal habitat for northern goshawk prior to the fire. Given the low risk associated with this herbicide to goshawks, use of herbicides would not impact individuals.

Bald Eagle

The North Shore project will have no impact to the bald eagle as there are no known nest sites within the project area. Although removal of suitable perching and roosting snags could occur, there are snag retention guidelines in places to ensure that there are higher quality snags remaining on the landscape for bald eagle roosts and there will be numerous snags remaining across the landscape. Given the low risk associated with this herbicide to the bald eagle, use of herbicides would not impact individuals.

Pallid, Townsend Big-eared, and Fringed Myotis Bats

The North Shore project may impact individuals, but is not likely to cause a trend towards federal listing because of the potential to disturb a tree roosting bat. However, due to the extent of suitable snags that will be left within the project area (post treatment), the designation of LOPs (300 ft buffer) around Pinnacle Rock and an unnamed rock outcrop near South Fork Long Valley Creek (May 15 – August 15) and the limited projects on going on private land within the planning area. Given the low risk associated with this herbicide to bats, use of herbicides would not impact individuals.

Fisher and Marten

The North Shore project will have no impact on the fisher or marten as this project would not alter or reduce suitable habitat for this species and the project area and this area is not likely inhabited by denning individuals. Fishers and martens seen in this area are likely dispersing individuals. Given the low risk associated with this herbicide to fisher or marten, use of herbicides would not impact individuals.

Foothill Yellow-legged Frog and Western Pond Turtle

The North Shore project may impact individuals, but is not likely to cause a trend towards federal listing because the potential to harm or harass individuals is very low if project design features and best management practices are followed.

Pacific Lamprey, Western Brook Lamprey, and Hardhead

The North Shore project will have no impact on these species since they have not occupied the project in recent history and there will be no reduction of suitable habitat within their historic range.

Clear Lake Hitch

The North Shore project may impact individuals, but is not likely to cause a trend towards federal listing because the potential to harm or harass individual is very low if project design features and best management practices are followed.

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